

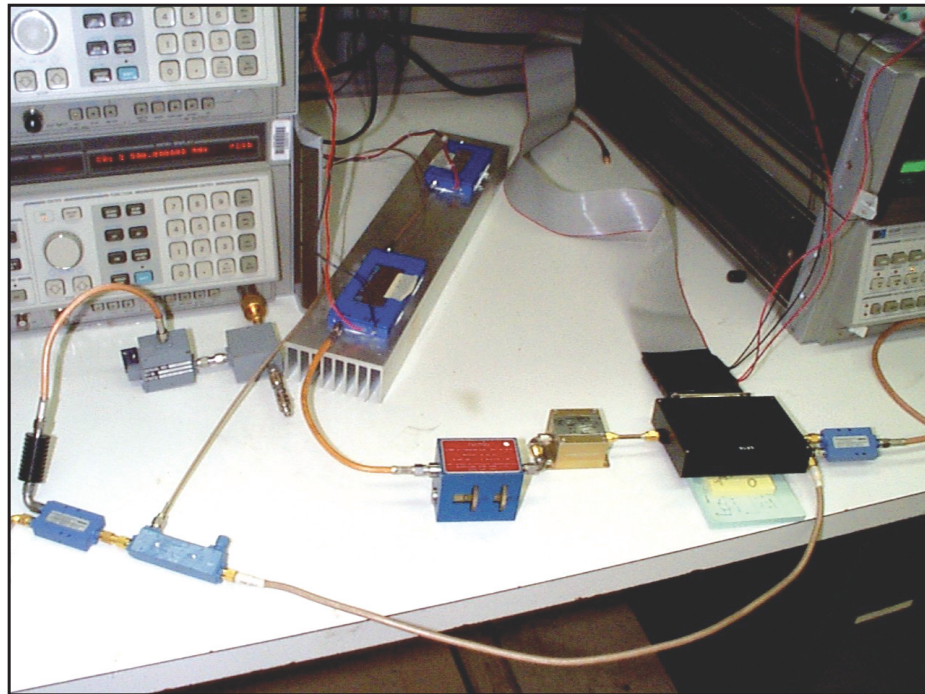


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Science and Technology for Tomorrow's Air and Space Force

Success Story

PROXIMITY TRANSMITTER INTERFERENCE LIMITING TECHNIQUE



The Sensors Directorate, through in-house research, designed a more efficient, cost-effective technique to limit transmitter signal interference in environments where multiple receivers and transmitters are present. The benefit of this new technique is the ability to suppress noise and/or extraneous signals that can prohibit a critical signal from being received and interpreted. Suppression can be completed without the need to access a sample of the transmitter signal at its source.



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Accomplishment

The new technique provides a low-complexity, reduced-cost, large signal interference suppression capability for receivers co-located near transmitters on a common platform. The invention is an analog solution to a difficult problem in which a digital equivalent does not exist. The ability to detect weak signals from a clutter of stronger signals is critical to many sensor platforms and recognizance/detection operations.

Background

Co-site interference is a serious problem in detecting low-level signals since many platforms have multiple transmitters in close proximity. The directorate's observation led to the investigation of the current techniques used to suppress extraneous signals and noise.

Conventional techniques for providing continuous wave signal interference mitigation between a common platform radio frequency transmitter and receiver involves installing signal couplers in the transmission path between the transmitter and the transmitting antenna. The couplers obtain a copy of a strong receiver-interfering transmitter signal for use in a signal subtraction or cancellation arrangement. This leads to the cancellation of the offending signal. This technique requires a significant amount of host platform characterization to be performed to install the signal suppression architectures.

The present invention provides active interference signal cancellation protection for a low-level receiver operation near a transmitter antenna and provides this protection with a nonlinear ferrite element without the need to access a sample of the transmitter signal at its source. The present invention allows a given receiver to maintain its sensitivity in the presence of a co-located transmitter operating simultaneously.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (04-SN-06)